

RX

Drug Name: Nitroglycerin
Trade Name: NitroStat, Nitrol, Nitrolingual,
Nitro-Bid Ointment, Tridil, Nitro, NTG
REVISED: November 1, 2017

Class:

Antianginal Agent
Nitrate
Vasodilator

Mechanism of Action:

Nitrates relax peripheral venous vessels, causing a pooling of venous blood and decreased venous return to the heart, which decreases preload.

Nitrates reduce both arterial impedance and venous filling pressures, resulting in a reduction of the left ventricular systolic wall tension, which decreases afterload. Decreases preload.

Results in the reduction of myocardial workload and myocardial oxygen demand.

Aids in the reversal of pulmonary edema.

It also causes some vasodilatation of coronary arteries (limited by atherosclerosis) increasing perfusion of ischemic myocardium.

Note: Nitroglycerin relaxes all other types of smooth muscle.

Indications:

Chest pain associated with angina
Chest pain associated with AMI
Acute pulmonary edema
Symptomatic Hypertension (Hypertensive Crisis)

Contraindications:

Head Injury, Increased ICP
Cerebral hemorrhage
Hypotension
Hypovolemia
Recent Viagra (sildenafil) use (**OR similar drugs**)
Hypersensitivity to nitrate
Constrictive Pericarditis, Pericardial Effusion
Severe anemia (*causes oxidation of hemoglobin to methemoglobin and could exacerbate anemia*)

Precautions:

Nitro deteriorates rapidly after bottle is opened, bottle should be opened and dated, and also protected from light.
Use with caution in closed-angle glaucoma, may increase intraocular pressure.
Elderly may be more susceptible to the effect of nitrates.
Hepatic disease (*metabolism may be impaired and lead to increased risk of methemoglobinemia*)
Postural hypotension.
Pregnancy (C)

Dosage:

Adults:

- **NTG Spray:** For discomfort suspicious of cardiac origin
 - SL: 0.4 mg SL spray/tab every 3-5 minutes PRN
 - Hold for B/P <100, or Viagra use (or similar drug) within previous 24 hours.
 - Use with caution in suspected right-sided MI

DRUG: NITROGLYCERIN

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This document is for **reference only**. Please refer to SWO's for specific indications, dosages, and applications

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- **HIGH DOSE NTG SPRAY:** For patients in extreme respiratory distress, signs of severe pulmonary edema, with associated HTN (SYSTOLIC B/P > 200 mm HG).
 - SL: 0.8 mg SL (0.4 mg spray/tab x2) every 5 minutes PRN
 - Hold for Viagra use (or similar drug) within previous 24 hours.
 - Return to normal dosing when B/P drops below 200 mm Hg.
- **NTG Paste:** Initiate if NTG is successful in reducing discomfort
 - TD: 0.5-1.5 inches applied topically (TD) to non-hairy area of trunk.
 - Hold for B/P <100, or Viagra use (or similar drug) within previous 24 hours. Use with caution in suspected right-sided MI
 - Wipe off if hypotension develops

Pediatrics:

- Not normally recommended for prehospital use

Onset:

- Tablet, Spray—1-3 minutes
- Ointment—20-60 minutes
- IV—Immediate

Duration:

- Tablet, Spray—up to 30 minutes
- Ointment—4-8 hours
- IV—several minutes, dose dependent.

Side Effects:

- Headache due to vasodilation
- Hypotension, Dizziness
- N/V
- Xerostomia (Dry Mouth)
- Methemoglobinemia (*rare, usually with high doses of the IV formulation, but can be seen with normal therapeutic doses*)
- Reflex tachycardia
- Skin rash, Flushing
- Anxiety
- Agitation

Interactions:

Alcohol (*can theoretically produce additive hypotension*)

Aspirin results in increased serum nitrate concentrations (*may cause increased hypotension, limited data*)

Calcium channel blockers & beta-blockers—additive interaction can result in symptomatic orthostatic hypotension.

Sympathomimetics may antagonize the effects of nitroglycerin.

May compromise the efficacy of alteplase, TPA when administered concomitantly.

REFERENCE ONLY

PEARLS:

- Nitroglycerine is of uncertain mortality benefit and has risks of hypotension. Therefore it should not be used in undifferentiated chest pain (chest pain that is not suspected of cardiac origin).

Nitroglycerin should be limited to patients who:

- Suspected ACS based on history and exam suspicious of cardiac origin.
- Patients with a history of coronary artery disease (CAD), angina, or previous heart attack as indicated by medications or reported history
- Suspected ACS with EKG changes (ST Depression, T wave inversion)
- Patient has history of angina and current presentation is similar.

The primary concern with nitroglycerine use is iatrogenic hypotension relative to the myocardial demand, which may increase mortality and morbidity.

- Do not shake canister prior to use; shaking may produce bubbles within the canister, which alters delivery of nitroglycerin
- Administer nitroglycerin by holding the canister upright with the valve head uppermost and the spray orifice as close to the opened mouth as possible
- Spray onto or under the tongue and immediately close the mouth. Do not swallow immediately after the dose is administered. Avoid inhalation of the spray
- Sublingual tablets: Place tablet under the tongue or in the buccal pouch and allow to dissolve. Do not swallow sublingual (intrabuccal) tablets
- Apply the nitroglycerin ointment with gloves and to a hair-free region of the torso. Cover with the dose-measuring application paper (may tape in place). Do not rub or massage the ointment as this will cause rapid absorption and interfere with the sustained action.
- Significant adsorption (80% of the nitroglycerin in solution) occurs with standard infusion sets made of PVC plastic. Use glass bottles only and special tubing provided by the manufacturer. Some pump tubing is OK for this use
- Wear gloves when applying paste, and avoid getting sprayed in the mouth by the spray or other NTG containing solutions. If you get ointment or IV Tridil on your skin, sit down quickly! If you get spray in your mouth, caffeinated beverages have been rumored to minimize the effects if consumed quickly (anecdotal reports)
- Orthostatic hypotension, xerostomia (dry mouth), & headache are probably the most common side effects associated with nitroglycerin administration, warn your patient
- NOTE: Patients receiving IV NTG generally are admitted to an ICU level of care. Therefore please take this into consideration when making a transportation decision
- Nitro drip—NTG drip is started at 5-10 $\mu\text{g}/\text{min}$, titrated for effect 5-10 $\mu\text{g}/\text{min}$ every 5 minutes up to a max of 200 $\mu\text{g}/\text{min}$ (**Hold for systolic <100, titrate up and down in 5 mcg increments**)
 - **NTG DRIP NOT COVERED IN SWO'S and requires a verbal or written physician order for each occurrence.**

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